



# XR<sup>TM</sup>-600B

## OPERATING GUIDE

**WARNING:**  
TO PREVENT ELECTRICAL SHOCK OR FIRE  
HAZARD, DO NOT EXPOSE THIS APPLIANCE  
TO RAIN OR MOISTURE.

### FEATURES:

6 balanced low impedance and 6 unbalanced high impedance inputs; channel "pre" monitor sends; 9-band graphic EQ; 300 watts RMS; effects loops.

### GENERAL DESCRIPTION

The new XR<sup>TM</sup>-600B represents our latest effort to combine professional features previously found only in separate mixer/equalizer/power amp components into a single compact and rugged package. The redesign of the XR-600B utilizes the latest advances in semiconductor technology and the overall circuitry has been designed and optimized by use of the latest computer-aided design techniques. This unit's improved specifications have been made possible by a thorough and complete design effort resulting in all new circuitry from the input jack through to the speaker output.

The XR-600B features six independent input channels and includes high impedance and balanced low impedance inputs, a separate "pre" monitor send, active shelving type high and low equalization, and a "post" effects send on **each** channel. Master level controls are provided for the main, monitor and effects mixes. A full nine-band graphic equalizer has been built into the system and utilizes the most contemporary active filter circuitry available. Additional flexibility is provided by the patch panel, enabling this versatile unit to be used in conjunction with an extremely wide range of auxiliary equipment. The new XR-600B also features the unique ability to blend reverb return signals into the monitor mix.

The newly re-engineered 300 watt RMS (2 ohms) power amplifier features our exclusive DDT<sup>TM</sup> ("Distortion Detection Technique") compression circuitry that electronically senses the onset of clipping and automatically activates the compression circuit to minimize distortion in the power amp. The use of this DDT compression circuit effectively increases the apparent headroom available, thus utilizing every precious watt of power available. This compression feature allows the XR-600B to quite effectively compete with systems having considerably more RMS power.

The power amp of the XR-600B utilizes eight high-voltage, high-speed T0-3 power devices bolted to a massive heatsink. The internal power supply consists of a very large power (mains) transformer featuring a grain oriented silicon steel core and a high degree of magnetic shielding to minimize extraneous hum fields. Silicon rectifiers connected in a full wave bridge feed power to large electrolytic filter banks and provide considerably more music power than the 300 watts power rating would indicate.

Overall, the XR-600B brings professional performance together in a single extremely versatile and compact package, offering features and specifications formerly available only with separate components.

### FRONT PANEL

#### INPUT JACKS (A) AND (B)

The new XR-600B is equipped with dual channel input connectors. The balanced low impedance input (A) is intended for use with low impedance microphones and accepts the professional XLR standard type connectors. The high impedance input (B) is equipped with standard phone jack connectors as per professional practice. NOTE: It is impossible to use **both** low and high impedance inputs on any single channel simultaneously.

#### CHANNEL CONTROLS

Each of the XR-600B's six independent channels contain five controls: Level, Monitor, Effects and High and Low Equalization.

#### CHANNEL LEVEL CONTROL (C)

This control varies the level of the input preamplifier. This input preamp is designed around a variable negative feedback approach and provides optimum dynamic range as well as extremely low noise operation. This control is used to set the level of the respective channels to achieve the **main mix**.

#### **CHANNEL MONITOR CONTROL (D)**

The channel monitor control is a totally independent level adjustment used for deriving the proper monitor mix. It is important that the user be aware that this channel monitor send is totally independent from all other channel controls and feeds directly into the monitor buss whose output is determined by the master monitor level control (I).

#### **CHANNEL EQUALIZATION CONTROLS**

The channel equalization controls are of the active "shelving" type and provide 15 dB of boost or cut in their respective frequency ranges. These equalization controls are extremely effective and will allow the user to achieve almost any blend of highs and lows with proper adjustment. Since these EQ controls are capable of a 30 dB range, care should be taken to properly utilize their capabilities. Excessive boosting of lows can cause "muffled" or "boomy" sounds, as well as tending to prematurely overload the power amp because of excessive low frequency power requirements. Overboosting the highs can cause "strident" or "screechy" tonality, as well as emphasizing residual preamp noise and increasing susceptibility to acoustic feedback. Care should be observed when using excessive cut in either frequency range since excessive cutting may degrade the dynamic range capabilities of the input preamp and create poor tonality.

These channel equalization controls have been provided to achieve tonal balance, as well as feedback control in the individual channels for the main mix only. All experimentation should begin with these controls set in the flat "0" (straight up or 12:00 o'clock) position. Use of the individual channel controls in conjunction with the master graphic equalizer is vital to provide the user with optimum equalization.

#### **CHANNEL LOW EQUALIZATION CONTROL (E)**

The low equalization control determines whether the low frequencies will be boosted or cut. Boost occurs in the clockwise settings, while cut occurs in the counterclockwise settings. Flat response is obtained in the "0" or vertical position.

#### **CHANNEL HIGH EQUALIZATION CONTROL (F)**

The high equalization control determines whether the high frequencies will be boosted or cut. Boost occurs in the clockwise settings, while cut occurs in the counterclockwise settings. Flat response is obtained in the "0" or vertical position.

#### **CHANNEL EFFECTS CONTROL (G)**

The channel effects send control adjusts the signal level applied to the effects mix buss which feeds the internal reverberation system, as well as the effects output on the patch panel. It is important to note that the effects send control is a "post" type adjustment which is located in the circuit **after** the channel gain and equalization controls. The user should be aware that use of the internal reverberation system can only occur when the channel gain, the channel effects send, the master effects level, the master reverb return and the master gain controls are all properly adjusted.

#### **MASTER SECTION**

The XR-600B master section contains the overall main level control, the master monitor control, the master effects control, the reverb return to main control, and the reverb return to monitor control, as well as a nine-band graphic equalizer and patch panel. As the name implies, the master controls operate as the final control element for the respective mixing busses, and the master graphic EQ determines the final overall equalization.

#### **MASTER MAIN CONTROL (H)**

The master main control adjusts the gain of the main mixing buss and determines the level at the main line output jack (Q), as well as the signal level applied to the input of the graphic equalizer/power amplifier. It is generally good practice to operate the main level control somewhere in the middle of its operating range to allow maximum flexibility in adjusting overall levels. It is poor practice to run the individual channel gains way up and the main control way down since this effectively negates flexibility afforded by the main control, as well as limiting dynamic range.

#### **MASTER MONITOR LEVEL CONTROL (I)**

The master monitor control adjusts the gain of the monitor mixing buss and determines the level of the signal available from the monitor output jack (R). The operation of this control is identical to that of the main master control and should be adjusted in a similar manner.

#### **MASTER EFFECTS CONTROL (J)**

The master effects control sets the signal level applied to the internal reverberation system and the effects output jack (S). It is important to note that no reverb effect or effects signal will result unless suitable settings of the master effects and channel effects controls are used. The action of this control is similar to both the main and monitor master controls and may be used accordingly to determine the overall output level of the effects mix buss.

#### **MASTER REVERB RETURN TO MAIN CONTROL (K)**

This master reverb return control determines the amount of delayed signal (reverberation) that is mixed back into the main mix buss. The action of this control is defeated by use of a remote switch being plugged into the footswitch jack (V) located on the patch panel. It is important to note that no reverberation will occur unless the internal delay line is being fed signal from the channel effects send controls. The master reverb return control **does not** affect the level available from the effects output jack (S) located on the patch panel.

#### **MASTER REVERB RETURN TO MONITOR CONTROL (L)**

This master reverb return control determines the amount of delayed signal (reverberation) that is mixed back into the monitor mix buss. The action of this control (L) is also defeated by use of the remote switch being plugged into the footswitch jack (V). The action of this control is similar to the master reverb return to main control except that it feeds the monitor system.

#### **MASTER AUXILIARY LEVEL CONTROL (M)**

The auxiliary level control determines the gain of the auxiliary input channel. This channel may be considered a seventh input into the master mixing buss and may be used for a wide variety of purposes. This auxiliary input channel is unequalized, except by the nine-band graphic, and features high input impedance and wide dynamic range to enable maximum compatibility with auxiliary units. It is important to realize that the main auxiliary input channel feeds the main mixing buss and the auxiliary level control determines the amount of auxiliary signal mixed into the main mix.

#### **GRAPHIC EQUALIZER (N)**

The nine-band equalizer is of the latest active type and exhibits performance comparable to that found in the finest commercial equipment. The graphic equalizer is located in the circuit just before the internal 300 watt power amplifier and provides a very versatile and professional equalization of the overall system. Because of the flexibility built into the XR-600B, several different modes of operation are possible.

##### **NORMAL MODE**

Under normal operating conditions (no external patch connections), the signal from the master main control is internally patched to the graphic input and the graphic output is internally patched to the power amp input.

##### **MONITOR OPERATION**

The internal graphic equalizer and power amp may be used to power a monitor system while the main system is powered by external devices. Connecting a short shielded cable between the monitor output and the graphic input will patch the monitor mix into equalizer/power amp. The monitor's speakers can now be driven by the internal power amp. The output from the main mix is now **only** available at the main output jack and must be patched from there to an external equalizer/power amplifier system to power the main system.

The unique patching facilities of the XR-600B allow practically any system configuration which uses independent mixer, equalizer and power amp combinations to be implemented using the features of the XR-600B.



## MASTER EQUALIZATION

The master graphic equalizer is designed to provide room equalization, effective feedback control, and overall system tone control. It is important to note that there are no firm operating instructions that will result in the ideal EQ for each and every set of operating conditions. Experimentation with adequate understanding of the graphic equalizer is necessary to achieve optimum results. No amount of equalization will correct an acoustically bad room/mic/speaker arrangement or completely correct the response curve of a poor loudspeaker.

Please make sure that the power amplifier has adequate headroom to handle any boost that may be incurred. If you boost 100Hz by 3 dB, your power requirement will double. As an example, if your normal performing level requires 100 watts, the power required after a 3 dB equalization boost will be 200 watts.

You should always begin operation with the equalizers in the "0" or center position. It is wise to avoid excessive cutting of large segments of the audio passband since this tends to reduce the dynamic range of the system. Also, it is better to raise the master level control rather than to use the majority of the equalizers in the boost position since better overall signal-to-noise ratio will result. As with any equalizer, careful experimentation and a little common sense will yield the best results.

## FEEDBACK CONTROL

A graphic equalizer can be used to great advantage for feedback suppression. The whole point of feedback equalization is to obtain the highest system gain before feedback. In essence, this requires a speaker system to be as flat as possible. The following procedure is given as a guide only! Use common sense and take your time when attempting the equalization process and your chances of obtaining the desired results will be very good.

Adjust all channel equalization and the graphic equalizer controls for an indicated flat response, and slowly bring up the level by use of the channel or master level controls until the system starts to go into feedback. Then very slowly adjust each section of the graphic equalizer until you find the one that has the most effect on the feedback. Return all other sections to the flat position, and bring up the gain until the system again goes into feedback. Repeat the procedure and equalize out the second and third feedback modes and more if necessary. **WARNING!** You should never have to cut more than 6 to 9 dB under normal conditions. If more cut is necessary, check for proper phasing of the speaker system and microphone positioning. One improperly phased speaker can cause unending feedback problems. Do not expect to obtain a system that is completely free of feedback. A simple 1-octave graphic equalizer can only do so much. In short, don't expect miracles....

## PILOT LED (O)

The pilot LED indicates when the electrical supply is switched on and is actually delivering power to the amplifier.

## DDT® COMPRESSION WITH LED INDICATOR (P)

The XR-600B is a compact and powerful system which features a 300 watt RMS power amplifier with a new type of dynamic compression. The compression effect enables us to maximize the performance of the amp/speaker combination. We have determined through much research that the compression circuitry should prevent the amp/speaker combination from running out of headroom (clipping) and should be as simple to operate as possible to avoid undue complication for the user. Because of the dynamics of a typical sound system, it is quite common to activate the compression, indicated by the limit LED (light emitting diode) (P), virtually constantly during a performance. This is what the compressor was designed to do; i.e., to maximize the dynamics available from the amp within its power output capabilities. We have not included other compression controls since we have designed an exclusive "Distortion Detection Technique" (DDT®) circuit (patent pending) which senses conditions that might cause overload, and compression is activated **only** when clipping is imminent. This technique effectively utilizes every precious watt available from the power amplifier.

## XR-600B PATCH PANEL

The patch panel of the XR-600B has been designed to allow use of auxiliary accessories, mixers, power amps, etc., in conjunction with this unit.

## MAIN OUTPUT (Q)

The main output provides output from the main mixing buss. This output is of relatively low impedance and is capable of over 4 volts RMS into 600 ohms or over 8 volts RMS into higher load impedances. The output level is determined by the gain and equalization settings of the individual channels as well as the main level control (H) in the master section.

## MONITOR OUTPUT (R)

The monitor output provides a signal for an external monitor system and is a relatively low output impedance capable of over 4 volts into 600 ohms or over 8 volts into higher load impedances. The level is controlled by settings of the individual channel monitor sends as well as the master monitor level control (I).

## EFFECTS OUTPUT (S)

The effects output delivers output signal from the effects buss for driving various line level devices. Caution should be observed when using accessory devices designed for guitar level (100 mV) to avoid overloading these devices with the relatively high output signal level available from the effects out. Overall signal level is determined by the setting of the various effects send controls of the respective channels, as well as the master effects control (J). This output is of relatively low impedance and is capable of approximately 4 volts into 600 ohms or 8 volts into higher load impedances.

## GRAPHIC INPUT (T)

The graphic input jack provides a means to allow patching into the internal graphic equalizer/power amp. The jack is of the switching type that normally picks up the signal from the main output jack (Q). When a plug is inserted into the graphic input, the circuit path is broken and this input may now be patched into other devices or any of the output jacks of the XR-600B. The graphic input provides much greater flexibility by allowing the internal graphic/power amp to be utilized as a monitor amp or for any other purpose the user may deem necessary independent of the preamp section. Its input impedance is approximately 50K ohms and requires a 1 volt signal level for full output at the speaker jacks with the equalizer flat.

## GRAPHIC OUT (U)

The graphic output provides access to the output of the graphic equalizer. In the normal operating mode, this signal is the same that is patched to the power amp and can be used to drive external accessories such as tape recorders and booster amplifiers. When a jack is plugged into the power amp input, the equalizer is disconnected from the internal power amp and, because we have provided patch points at the input and at the output of the graphic, the equalizer can be patched "in line" elsewhere in the XR-600B or in conjunction with external accessories thus providing total system flexibility.

## FOOTSWITCH (V)

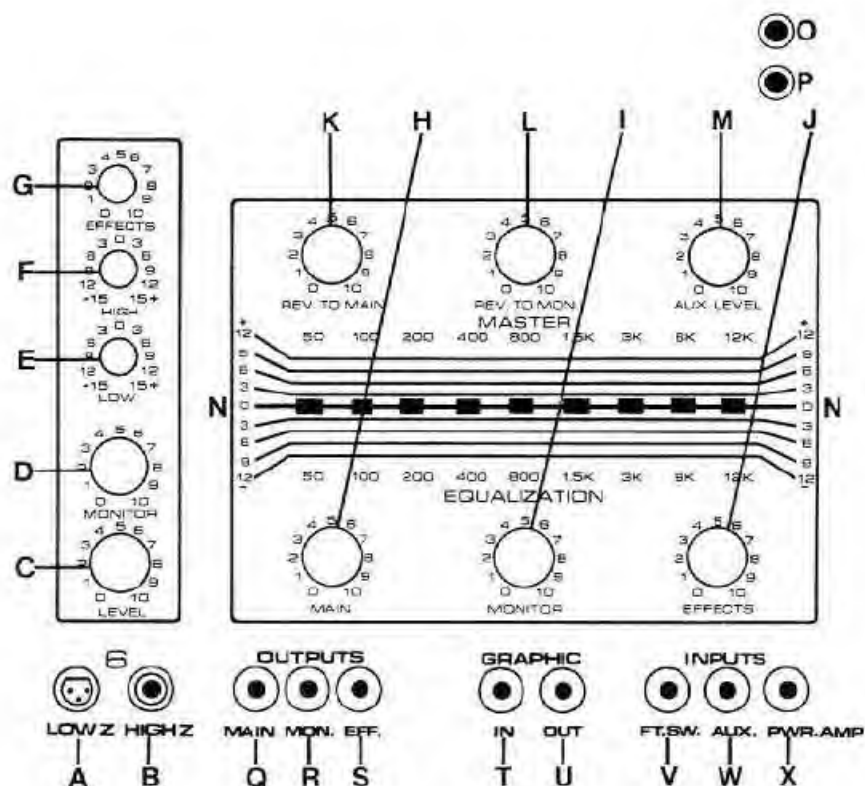
The footswitch jack accommodates the optional remote reverb cutoff pedal. This footswitch jack is conventional and should present no operational problems.

## AUXILIARY INPUT (W)

The auxiliary input provides access to the main mixing buss for patching in signals from the external devices such as delay lines or extra mixing channels. Its input impedance is 220K ohms and is designed for low to medium level signals of up to 2 volts RMS.

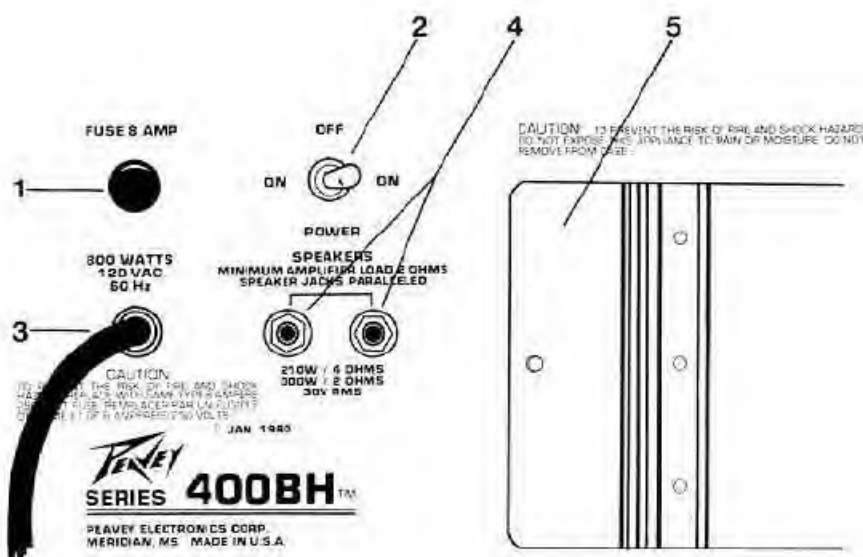
## POWER AMP INPUT (X)

The power amp input has been provided to allow the XR-600B's internal power amplifier to be patched into any output of the XR-600B or to any signal source capable of delivering 1 volt RMS into 10K ohms. The power amp input is normally internally patched to the graphic output (U). When a jack is inserted into the power amp input, the internal patch is broken. This isolates the graphic equalizer and makes the power amp's input available to signals from other devices or any of the output jacks of the XR-600B.



**front  
panel**

**rear  
panel**



**CONTROL  
LOCATION  
DIAGRAM**

## REAR PANEL

### FUSE (1)

The fuse is located within the cap of the fuseholder. It is necessary that the fuse be replaced with the proper type and value fuse if it should fail in order to avoid damage to the equipment and to prevent voiding the warranty. If your unit repeatedly blows fuses, it should be taken to a qualified service center for repair.

### POWER SWITCH (2)

On domestic units, the power switch is of the three-position type with the center position being "OFF." This switch has two "ON" positions, one of which is used to ground the amplifier properly. One of the "ON" positions will yield the lowest amount of residual hum or "popping" and this is the position that should be used.

On export models, we utilize a simple on/off switch that does not have multiple "ON" positions since the grounding (earthing) conditions in most countries are made positively through standard tamper-proof plug-in systems.

### LINE CORD (3)

For your safety, we have incorporated a three-wire line (mains) cable with proper grounding facilities. It is not advisable to remove the ground pin under any circumstances. If it is necessary to use the amp in a two-pin plug system without proper grounding facilities, suitable grounding adaptors should be used. Much less noise and greatly reduced shock hazard exist when the unit is operated with the proper grounded receptacles.

### SPEAKER OUTPUTS (4)

The speaker output jacks are of the standard  $\frac{1}{4}$ " type. Both the output jacks are wired in parallel and either or both may be used when connecting your speaker system. The 400BH module is optimized for a 4 ohm load but has been designed to drive loads down to 2 ohms. Load impedances lower than 2 ohms may overload the power amplifier and cause premature activation of the power amp's short circuit protection system and/or thermal fault protection circuitry. Because of the unique design of the compressor, the circuit will still minimize clipping regardless of load values.

### LINE (MAINS) CORD RETAINER (5)

We have provided two large molded line cord retainers on the rear panel to allow storage of the mains cable for travel. In operation, the cable should be completely unwrapped to allow maximum heat dissipation from the rear panel/heatsink.

## XR-600B SPECS

### SUMMARY OF FUNCTIONS:

6 in., 1 main out, 1 pre monitor out, 1 post effects out, 2-band EQ each channel, internal reverb, 1 patchable 9-band graphic EQ, 300 watt power amp with DDT® compression

### INPUTS, EACH OF 6 CHANNELS:

1 low Z balanced mic, 1 high Z unbalanced line

### INPUTS, MASTER:

1 high Z unbalanced line each for auxiliary, graphic and power amp

### OUTPUTS, MASTER:

1 low Z unbalanced line each for main, monitor, effects and graphic; reverb footswitch jack

### OUTPUTS, POWER AMP:

2 parallel jacks, 2 ohm minimum load

### MIXER SECTION:

THE FOLLOWING PREAMP SPECIFICATIONS ARE MEASURED WITH ALL EQ FLAT @ 0 dB; MASTERS @ 12:00; NOMINAL SIGNAL LEVELS ARE WITH CHANNEL LEVEL @ 12:00; MINIMUM SIGNAL LEVELS ARE WITH CHANNEL LEVEL @ FULL CLOCKWISE

### CHANNEL MICROPHONE (LOW Z) INPUTS:

Input Impedance: (600 ohms) balanced  
Nominal Input Level: -28 dBm, 60 mV RMS  
Minimum Input Level: -44 dBm, 10 mV RMS  
Maximum Input Level: -4 dBm, 1V RMS

### CHANNEL LINE (HIGH Z MIC) INPUTS & AUXILIARY INPUT:

Input Impedance: High Z (220K ohms) unbalanced  
Nominal Input Level: -14 dBV, 200 mV RMS  
Minimum Input Level: -30 dBV, 30 mV RMS  
Maximum Input Level: +10 dBV, 3V RMS

### GRAPHIC INPUT:

Input Impedance: High Z (100K ohms) unbalanced  
Nominal Input Level: 0 dBV, 1V RMS

### MAIN, MONITOR, EFFECTS & GRAPHIC UNBALANCED OUTPUTS:

Load Impedance: 600 ohms or greater  
Nominal Output: 0 dBV, 1V RMS  
Maximum Output: +18 dBV, 8V RMS into 50K ohms load  
Maximum Output: +14 dBm, 4V RMS into 600 ohms load

THE FOLLOWING SPECS MEASURED AT NOMINAL SETTINGS WITH ALL EQ SET FLAT @ 0 dB, ALL LOW Z INPUTS TERMINATED @ 600 OHMS OR ALL HIGH INPUTS TERMINATED @ 47K OHM

### FREQUENCY RESPONSE:

(Any In/out combination with 1V RMS output)  
+0, -2 dB, 30 Hz to 20 KHz

### PREAMP HUM & NOISE: (All channels on)

-82 dBV High Z line inputs  
-80 dBV Low Z mic inputs

### OVERALL DISTORTION:

(Any In/out combination, 20 Hz to 20 KHz @ 1V RMS)  
Less than .1% THD, Typically below .05%

### CHANNEL EQ:

+15 dB @ 60 Hz & 8 KHz, Shelving

### MASTER GRAPHIC EQ:

+15 dB @ 50 Hz, 100 Hz, 200 Hz, 400 Hz, 800 Hz, 1.5 KHz, 3 KHz, 6 KHz, & 12 KHz, Peak/Notch, Average "Q" of 1.8

### MAXIMUM AVAILABLE GAIN:

+14 dB Master control  
+30 dB Channel control (High Z)  
+16 dB Balanced input amp  
+60 dB Total

### POWER AMPLIFIER SECTION: (400BH MODULE WITH DDT®)

### FREQUENCY RESPONSE:

+0, -1 dB, 10 Hz to 30 KHz @ 200 watts into 4 ohms

### RATED POWER & LOAD:

210W RMS into 4 ohms  
300W RMS into 2 ohms

### POWER @ CLIPPING:

(1% THD, 1 KHz, 120 VAC line)  
Typically:  
130W RMS into 8 ohms  
225W RMS into 4 ohms  
320W RMS into 2 ohms

### TOTAL HARMONIC DISTORTION:

Less than 0.1%, 200 mW to 200W RMS, 20 Hz to 10 KHz,  
Typically below .05%

### INTERMODULATION DISTORTION:

Less than 0.1%, 200 mW to 200W RMS, 60 Hz & 5 KHz, 4 ohms,  
Typically below .05%

### DDT® DYNAMIC RANGE:

Greater than 25 dB

### DDT® MAXIMUM THD: (1 KHz)

Below 0.5% THD for 6 dB overload  
Below 1% THD for 20 dB overload

### HUM & NOISE:

90 dB below 200W, 20 Hz to 20 KHz

### SLEW RATE:

Greater than 15V/uSec

### DAMPING FACTOR:

Greater than 100 @ 1 KHz, 4 ohms

### INPUT SENSITIVITY:

1V RMS for 200W into 4 ohms

### INPUT IMPEDANCE:

22K ohms, overload protected

### POWER REQUIREMENTS: (Domestic)

800W, 120 VAC, 50/60 Hz

Specifications are subject to change without notice.



**DANGER**  
EXPOSURE TO EXTREMELY HIGH NOISE LEVELS MAY CAUSE A PERMANENT HEARING LOSS. INDIVIDUALS VARY CONSIDERABLY IN SUSCEPTIBILITY TO NOISE INDUCED HEARING LOSS, BUT NEARLY EVERYONE WILL LOSE SOME HEARING IF EXPOSED TO SUFFICIENTLY INTENSE NOISE FOR A SUFFICIENT TIME.  
THE U.S. GOVERNMENT'S OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) HAS SPECIFIED THE FOLLOWING PERMISSIBLE NOISE LEVEL EXPOSURES:

**DURATION PER DAY IN HOURS**

8  
6  
4  
3  
2  
1 1/2  
1  
1/2  
or less

**SOUND LEVEL dBA, SLOW RESPONSE**

90  
92  
95  
97  
100  
102  
105  
110  
115

ACCORDING TO OSHA, ANY EXPOSURE IN EXCESS OF THE ABOVE PERMISSIBLE LIMITS COULD RESULT IN SOME HEARING LOSS.

EAR PLUGS OR PROTECTORS IN THE EAR CANALS OR OVER THE EARS MUST BE WORN WHEN OPERATING THIS AMPLIFICATION SYSTEM IN ORDER TO PREVENT A PERMANENT HEARING LOSS IF EXPOSURE IS IN EXCESS OF THE LIMITS AS SET FORTH ABOVE. TO INSURE AGAINST POTENTIALLY DANGEROUS EXPOSURE TO HIGH SOUND PRESSURE LEVELS, IT IS RECOMMENDED THAT ALL PERSONS EXPOSED TO EQUIPMENT CAPABLE OF PRODUCING HIGH SOUND PRESSURE LEVELS SUCH AS THIS AMPLIFICATION SYSTEM BE PROTECTED BY HEARING PROTECTORS WHILE THIS UNIT IS IN OPERATION.

**CAUTION**

THIS AMPLIFIER HAS BEEN DESIGNED AND CONSTRUCTED TO PROVIDE ADEQUATE POWER RESERVE FOR PLAYING MODERN MUSIC WHICH MAY REQUIRE OCCASIONAL PEAK POWER. TO HANDLE OCCASIONAL PEAK POWER, ADEQUATE POWER "HEADROOM" HAS BEEN DESIGNED INTO THIS SYSTEM. EXTENDED OPERATION AT ABSOLUTE MAXIMUM POWER CAPACITY IS NOT RECOMMENDED SINCE THIS COULD DAMAGE THE ASSOCIATED LOUDSPEAKER SYSTEM. PLEASE BE AWARE THAT MAXIMUM POWER CAN BE OBTAINED WITH VERY LOW SETTINGS OF THE GAIN CONTROLS IF THE INPUT SIGNAL IS VERY STRONG.

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be retained for future reference.
3. Obey all cautions in the operating instructions and on the back of the unit.
4. All operating instructions should be followed.
5. This product should not be used near water, i.e. a bathtub, sink, swimming pool, wet basement, etc.
6. This product should be located so that its position does not interfere with its proper ventilation. It should not be placed flat against a wall or placed in a built-in enclosure that will impede the flow of cooling air.
7. This product should not be placed near a source of heat such as a stove, heater, radiator or another heat producing appliance.
8. Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
9. Never break off the ground pin on the power supply cord. For more information on grounding, write for our free booklet: "Shock Hazard and Grounding."
10. Power supply cords should always be handled carefully. Never walk or place equipment on power supply cords. Periodically check cords for cuts or signs of stress, especially at the plug and the point where the cord exits the unit.
11. The power supply cord should be unplugged when the unit is to be unused for long periods of time.
12. Metal parts can be cleaned with a damp rag. The vinyl covering used on some units can be cleaned with a damp rag or an ammonia based household cleaner if necessary.
13. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation holes or any other openings.
14. This unit should be checked by a qualified service technician if:
  - A. The power supply cord or plug has been damaged.
  - B. Anything has fallen on or been spilled into the unit.
  - C. The unit does not operate correctly.
  - D. The unit has been dropped or the enclosure damaged.
15. The user should not attempt to service this equipment. All service work should be done by a qualified service technician.

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8  
6  
4  
3  
2  
1 1/2  
1  
1/2  
or less

**SOUND LEVEL dBA, SLOW RESPONSE**

90  
92  
95  
97  
100  
102  
105  
110  
115

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EAR PLUGS OR PROTECTORS IN THE EAR CANALS OR OVER THE EARS MUST BE WORN WHEN OPERATING THIS AMPLIFICATION SYSTEM IN ORDER TO PREVENT A PERMANENT HEARING LOSS IF EXPOSURE IS IN EXCESS OF THE LIMITS AS SET FORTH ABOVE. TO INSURE AGAINST POTENTIALLY DANGEROUS EXPOSURE TO HIGH SOUND PRESSURE LEVELS, IT IS RECOMMENDED THAT ALL PERSONS EXPOSED TO EQUIPMENT CAPABLE OF PRODUCING HIGH SOUND PRESSURE LEVELS SUCH AS THIS AMPLIFICATION SYSTEM BE PROTECTED BY HEARING PROTECTORS WHILE THIS UNIT IS IN OPERATION.

**CAUTION**

THIS MIXING CONSOLE/PREAMP HAS BEEN DESIGNED AND CONSTRUCTED TO PROVIDE ADEQUATE SIGNAL VOLTAGE FOR PLAYING MODERN MUSIC. IMPROPER USE OF THE GAIN/EQUALIZATION CONTROLS AND/OR IMPROPER USE OF INTERNAL/EXTERNAL BUSES MAY CREATE CLIPPING (SQUARE WAVES) AND POSSIBLY CAUSE SUBSEQUENT DAMAGE TO THE LOUDSPEAKER SYSTEMS. EXTENDED OPERATION OF THE GAIN/EQUALIZATION CONTROLS IN THEIR MAXIMUM POSITIONS IS THEREFORE, NOT RECOMMENDED. PLEASE BE AWARE THAT MAXIMUM POWER CAN BE OBTAINED WITH VERY LOW SETTINGS OF THE GAIN/EQUALIZATION CONTROLS IF THE INPUT SIGNAL IS VERY STRONG. IT IS COMMON PRACTICE AMONG USERS OF SOUND REINFORCEMENT EQUIPMENT TO IDENTIFY THE INDIVIDUAL CHANNELS WITH A STRIP OF TAPE PLACED ABOVE OR BELOW THE ROW OF VOLUME FADERS. MANY TYPES OF BRANDS OF TAPE HAVE A VERY STRONG ADHESIVE WHICH CAN PERMIT THE TAPE TO BE REMOVED WITHOUT REMOVING THE PAINT WHEN THE TAPE IS REMOVED. WE STRONGLY RECOMMEND THAT SCOTCH TAPE NOT BE USED ON PAINTED SURFACES NOR ANY OTHER TAPE THAT IS NOT SPECIALLY DESIGNED FOR SUCH APPLICATIONS. MEDIUM OR LIGHT ADHESIVE MASKING OR MOKER LABEL TAPE IS RECOMMENDED IF TAPE IS USED. ANY TAPE LEFT ON PAINTED SURFACE FOR EXTENDED PERIODS WILL BE DIFFICULT TO REMOVE. NEVER USE CLEAR OR SCOTCH TAPE FOR THESE APPLICATIONS.

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be retained for future reference.
3. Obey all cautions in the operating instructions and on the back of the unit.
4. All operating instructions should be followed.
5. This product should not be used near water, i.e. a bathtub, sink, swimming pool, wet basement, etc.
6. This product should be located so that its position does not interfere with its proper ventilation. It should not be placed flat against a wall or placed in a built-in enclosure that will impede the flow of cooling air.
7. This product should not be placed near a source of heat such as a stove, heater, radiator or another heat producing appliance.
8. Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
9. Never break off the ground pin on the power supply cord. For more information on grounding, write for our free booklet: "Shock Hazard and Grounding."
10. Power supply cords should always be handled carefully. Never walk or place equipment on power supply cords. Periodically check cords for cuts or signs of stress, especially at the plug and the point where the cord exits the unit.
11. The power supply cord should be unplugged when the unit is to be unused for long periods of time.
12. Metal parts can be cleaned with a damp rag. The vinyl covering used on some units can be cleaned with a damp rag or an ammonia based household cleaner if necessary.
13. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation holes or any other openings.
14. This unit should be checked by a qualified service technician if:
  - A. The power supply cord or plug has been damaged.
  - B. Anything has fallen on or been spilled into the unit.
  - C. The unit does not operate correctly.
  - D. The unit has been dropped or the enclosure damaged.
15. The user should not attempt to service this equipment. All service work should be done by a qualified service technician.

Due to our efforts for constant improvement, features and specifications are subject to change without notice.



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